What is claimed is:

1. A semiconductor device comprising:

a semiconductor substrate;

a first insulating film formed over said semiconductor substrate;

a wiring opening formed in said first insulating film;

a wiring having a first conductive film containing copper as a primary component, and embedded in said wiring opening;

a first barrier insulating film formed over said wiring and said first insulating film;

a second barrier insulating film formed over said first barrier insulating film; and

a second insulating film formed on said second barrier insulating film and having a lower dielectric constant than that of an oxide silicon film,

wherein a barrier property of said first barrier insulating film to copper is larger than that of said second barrier insulating film to the copper, and

adhesiveness between said second barrier insulating film and said second insulating film is larger than that between said first barrier insulating film and said second insulating film at the time when said second insulating film is formed over said first barrier insulating film.

2. The semiconductor device according to claim 1,

wherein the thickness of said first barrier insulating

film is thicker than that of said second barrier insulating film.

3. The semiconductor device according to claim 1, wherein the thickness of said first barrier insulating film is 40 nm or less.

4. The semiconductor device according to claim 1, wherein said second insulating film is a film formed by a coating or CVD method.

5. The semiconductor device according to claim 1, wherein said wiring has a barrier conductive film formed on a bottom surface and a side surface of said wiring opening, and said first conductive film formed over said barrier conductive film.

6. The semiconductor device according to claim 1, wherein said first barrier insulating film is made of a material containing silicon and carbon and at least one of nitrogen and oxygen.

7. The semiconductor device according to claim 1, wherein said second barrier insulating film is made of silicon carbide.

8. The semiconductor device according to claim 1, wherein said second insulating film is made of a material containing silicon, oxygen, and carbon.

9. The semiconductor device according to claim 1, wherein a copper compound film whose diffusion coefficient is smaller than that of copper or a metal film made of metal other than copper is formed over a surface of

said wiring.

10. The semiconductor device according to claim 1, wherein a surface of said wiring is nitrided.

11. The semiconductor device according to claim 1, wherein a third insulating film is formed between said first insulating film and said first barrier insulating film.

12. The semiconductor device according to claim 11, wherein a fourth insulating film is formed between said first and third insulating films.

13. A semiconductor device comprising:

a semiconductor substrate;

a first insulating film formed over said semiconductor substrate;

a wiring opening formed in said first insulating film;

a wiring having a first conductive film containing copper as a primary component, and embedded in said wiring opening;

a second insulating film formed over said wiring and said first insulating film, and made of a material including silicon and carbon and at least one of nitrogen and oxygen;

a third insulating film made of silicon carbide and formed over said second insulating film; and

a fourth insulating film formed over said third insulating film, and having a lower dielectric constant

than that of an oxide silicon film.

14. The semiconductor device according to claim 13, wherein said fourth insulating film is made of a material containing silicon, oxygen, and carbon.

15. A semiconductor device comprising:

a semiconductor substrate;

a first insulating film formed over said semiconductor substrate;

a wiring opening formed in said first insulating film;

a wiring having a first conductive film containing copper as a primary component, and embedded in said wiring opening;

a barrier insulating film formed over said wiring and said first insulating film; and

a second insulating film formed over said barrier insulating film, and having a lower dielectric constant than that of an oxide silicon film,

wherein a concentration of nitrogen in said barrier insulating film near an interface between said wiring and said barrier insulating film is higher than that of the said barrier insulating film near an interface between said second insulating film and said barrier insulating film.

16. The semiconductor device according to claim 15, wherein said barrier insulating film is made of a material containing silicon, carbon, and nitrogen.

17. A semiconductor device comprising:

a semiconductor substrate;

a first insulating film formed over said semiconductor substrate;

a wiring opening formed in said first insulating film;

a wiring having a first conductive film containing copper as a primary component, and embedded in said wiring opening;

a second insulating film formed over said wiring and said first insulating film, and having a function of restraining or preventing diffusion of copper; and

a third insulating film formed over said second insulating film, and having a function of controlling a stress,

wherein the stress of a laminated film of said second and third insulating films is -180 MPa or more.

18. The semiconductor device according to claim 17,

wherein said third insulating film functions so as to relax the stress generated by said second insulating film.

19. The semiconductor device according to claim 17,

wherein said second insulating film is a film generating a compression stress, and said third insulating film is a film generating a tensile stress.

20. The semiconductor device according to claim 17,

wherein said second insulating film is made of a material containing silicon, carbon, and nitrogen.

21. The semiconductor device according to claim 17,

wherein said third insulating film is made of silicon carbide.

22. A manufacturing method for a semiconductor device, comprising the steps of:

(a) preparing a semiconductor substrate;

(b) forming a first insulating film over said semiconductor substrate;

(c) forming a first wiring opening in said first insulating film;

(d) forming a wiring having, in said first wiring opening, a first conductive film containing copper as a primary component;

(e) forming a first barrier insulating film over said first insulating film in which said wiring is embedded;

(f) forming a second barrier insulating film over said first barrier insulating film; and

(g) forming a second insulating film having, over said second barrier insulating film, a lower dielectric constant than that of an oxide silicon film,

wherein a barrier property of said first barrier insulating film to copper is larger than that of said second barrier insulating film to copper, and

adhesiveness between said second barrier insulating film and said second insulating film is larger than that between said first barrier insulating film and said second insulating film at the time when said second insulating film is formed over said first barrier insulating film.

23. The manufacturing method for a semiconductor device according to claim 22, further comprising, after said step (g), the steps of:

(h) forming, by dry etching, a second opening in said first and second barrier insulating films and said second insulating film; and

(i) embedding a conductive film containing copper as a primary component in said second opening,

wherein said second barrier insulating film functions as an etching stopper film at the time of forming said second opening.

24. The manufacturing method for a semiconductor device according to claim 22,

wherein said second insulating film is formed by a coating or CVD method.

25. The manufacturing method for a semiconductor device according to claim 22,

wherein the thickness of said first barrier insulating film is thicker than that of said second barrier insulating film.

26. THe manufacturing method for a semiconductor device according to claim 22,

wherein the thickness of said first barrier insulating film is 40 nm or less.

27. The manufacturing method for a semiconductor device according to claim 22,

wherein said first barrier insulating film is made of

a material containing silicon and carbon and at least one of nitrogen and oxygen.

28. The manufacturing method for a semiconductor device according to claim 22,

wherein said second barrier insulating film is made of silicon carbide.

29. The manufacturing method for a semiconductor device according to claim 22, further comprising, after said step (d) and before said step (e), the step of:

forming a copper compound film whose diffusion coefficient is smaller than that of copper or a metal film made of meta other than copper, over the surface of said wiring.

30. The manufacturing method for a semiconductor device according to claim 22, further comprising, after said step (d) and before said step (e), the step of:

nitriding the surface of said wiring.

31. The manufacturing method for a semiconductor device according to claim 22, further comprising, after said step (b), the step of:

forming a third insulating film over said first insulating film,

wherein said step (d) comprises the step of: depositing said first conductive film in said first wiring opening and on said third insulating film; and removing said first conductive film other than said first conductive film embedded in said first wiring opening, and

in the step of removing said first conductive film, said third insulating film has a function as a protective film of said first insulating film.

32. The manufacturing method for a semiconductor device according to claim 22, further comprising the steps of:

(h) forming a mask constituted from a third insulating film over said second insulating film; and

(i) forming a hole connected to said wiring by etching said second insulating film using said mask.

33. The manufacturing method for a semiconductor device according to claim 22, further comprising the steps of:

(h) forming a first mask constituted from a third insulating film and a second mask constituted from a fourth insulating film, over said second insulating film; and

(i) forming a hole connected to said wiring by etching said second insulating film using said first mask, and a wiring groove whose diameter is larger than that of said hole by etching said second insulating film using said second film.

34. A manufacturing method for a semiconductor device, comprising the steps of:

(a) preparing a semiconductor substrate;

(b) forming a first insulating film over said semiconductor substrate;

(c) forming a first wiring opening in said first

insulating film;

(d) forming a wiring having a first conductive film containing copper as a primary component, in said first wiring opening;

(e) forming a second insulating film made of a material containing silicon and carbon and at least one of nitrogen and oxygen, over said first insulating film in which said wiring is embedded;

(f) forming a third insulating film made of silicon carbide, over said second insulating film; and

(g) forming a fourth insulating film having a lower dielectric constant than that of an oxide silicon film, over said third insulating film.

35. The manufacturing method for a semiconductor device according to claim 34,

wherein said fourth insulating film is made of a material containing silicon, oxygen, and carbon.

36. A manufacturing method for a semiconductor device, comprising the steps of:

(a) preparing a semiconductor substrate;

(b) forming a first insulating film over said semiconductor substrate;

(c) forming a first wiring opening in said first insulating film;

(d) forming a wiring having a first conductive film containing copper as a primary component, in said first wiring opening;

(e) forming a barrier insulating film over said first insulating film in which said wiring are embedded; and

(f) forming a second insulating film having a lower dielectric constant than that of an oxide silicon film, over said barrier insulating film,

wherein a concentration of nitrogen in said barrier insulating film near an interface between said wiring and said barrier insulating film is higher than that of said barrier insulating film near an interface between said second insulating film and said barrier insulating film.

37. The manufacturing method for a semiconductor device according to claim 36,

wherein said barrier insulating film is made of a material containing silicon, carbon, and nitrogen.

38. The manufacturing method for a semiconductor device according to claim 36,

wherein, in said step (e), said barrier insulating film is formed by a CVD method using a nitrogen gas, and a flow amount of nitrogen gas introduced into a film-forming apparatus at an initial film-forming stage of said barrier insulating film is more than that at a latter film-forming stage of said barrier insulating film.

39. The manufacturing method for a semiconductor device according to claim 36,

wherein, in said step (e), said barrier insulating film is formed by a CVD method using a nitrogen gas, and, at a latter film-forming stage of said barrier insulating

film, an introduction of the nitrogen gas into a film-forming apparatus is stopped.